

## WHAT IS CLAIMED IS:

1. A method of imaging a patient comprising:

coupling at least one detector to a detector transport member such that the at least one detector moves with the detector transport member, the detector transport member spanning an arc of less than about one hundred eighty degrees about an examination axis;

supporting the detector transport member with a base having a support assembly for receiving the detector transport member; and

rotating the detector transport member about the examination axis to a plurality of imaging positions.

2. A method of imaging a patient in accordance with Claim 1 further comprising positioning a patient through a gap in the detector transport member where the patient is substantially aligned with the examination axis,

3. A method of imaging a patient in accordance with Claim 1 wherein the detector transport member includes an edge and the base includes a support assembly having a groove and wherein supporting the detector transport member comprises engaging the groove with the edge such that the groove and edge oppose a moment load on the edge from the weight of the detector transport member.

4. A method of imaging a patient in accordance with Claim 1 wherein the detector transport member includes a support assembly having a groove and the base includes an edge and wherein supporting the detector transport member comprises engaging the groove with the edge such that the groove and edge oppose a moment load on the groove from the weight of the detector transport member.

5. A method of imaging a patient in accordance with Claim 1 wherein the detector transport member includes a rack and the base includes a complementary pinion and wherein rotating the detector transport member about the examination axis comprises controlling the rotation of an electrical motor coupled to

the pinion to perform at least one of move the detector transport member between a plurality of imaging positions and maintaining the detector transport member substantially stationary at an imaging position.

6. A method of imaging a patient in accordance with Claim 5 further comprising powering the motor from an electrical source located in the base.

7. A method of imaging a patient in accordance with Claim 1 wherein rotating the detector transport member about the examination axis comprises rotating the detector transport member less than about one hundred eighty degrees while imaging the patient.

8. A method of imaging a patient in accordance with Claim 7 wherein rotating the detector transport member about the examination axis comprises rotating the detector transport member about ninety degrees while imaging the patient.

9. A method of imaging a patient in accordance with Claim 7 wherein rotating the detector transport member about the examination axis comprises rotating the detector transport member about ninety degrees while receiving images for an about one hundred eighty degree scan of the patient.

10. A method of imaging a patient in accordance with Claim 1 further comprising receiving at least one of transmission x-ray photons, transmission gamma rays, and emission gamma rays using the at least one detector.

11. A method of imaging a patient comprising:

aligning a patient with an examination axis by moving the patient through a gap in an arcuate detector transport member;

rotating at least one detector about the examination axis through an arc spanning less than about one hundred eighty degrees, the detector moving with the detector transport member, said rotating comprises at least one of rotating the detector transport member intermittently between a plurality of imaging positions and rotating the detector transport member continuously from a imaging start position to a imaging

finish position wherein the detector transport member spans an arc of less than about one hundred eighty degrees about the examination axis; and

supporting the detector transport member with an arcuate base having an arcuate support assembly for receiving the detector transport member, the base remaining stationary with respect to the examination axis.

12. A method for medical imaging comprising:

rotating a detector transport member along an arcuate path about an examination axis, at least one detector being coupled to said detector transport member; and

supporting the detector transport member with an arcuate base having an arcuate support assembly for receiving the detector transport member, the base remaining stationary with respect to the examination axis.

13. A method for medical imaging in accordance with Claim 12 wherein said rotating a detector transport member comprises at least one of rotating the detector transport member intermittently between a plurality of imaging positions and rotating the detector transport member continuously from a imaging start position to a imaging finish position.

14. A method for medical imaging in accordance with Claim 13 wherein said rotating a detector transport member comprises rotating the detector transport member through an arc of less than about one hundred eighty degrees about the examination axis from the imaging start position to the imaging finish position.

15. An imaging system comprising:

an arcuate detector transport member that extends circumferentially about an examination axis;

an arcuate base comprising an arcuate support assembly for receiving said detector transport member, said base configured to rotate said arcuate detector

transport member about said examination axis to at least one of a plurality of imaging positions; and

at least one detector coupled to said detector transport member.

16. An imaging system in accordance with Claim 15 wherein said arcuate detector transport member extends less than about two hundred seventy degrees circumferentially about said examination axis.

17. An imaging system in accordance with Claim 16 wherein said arcuate detector transport member extends less than about one hundred eighty degrees circumferentially about said examination axis.

18. An imaging system in accordance with Claim 15 wherein said detector transport member is moveable along an arc defined by said base.

19. An imaging system in accordance with Claim 15 wherein said detector transport member comprises a toothed rack configured to engage a pinion that is rotatably coupled to said base, said rack and said pinion configured to transmit a force from said base to said detector transport member that causes said detector transport member to move relative to said base.

20. An imaging system in accordance with Claim 19 wherein said pinion is powered from an electric motor.

21. An imaging system in accordance with Claim 20 wherein said electric motor is powered from an electrical source located in said base.

22. An imaging system in accordance with Claim 19 wherein said toothed rack is coupled to an outer periphery of said detector transport member.

23. An imaging system in accordance with Claim 15 wherein said detector transport member comprises a sliding member configured to engage a support assembly coupled to said base, said sliding member configured to guide said detector transport member along an arcuate path.

24. An imaging system in accordance with Claim 23 wherein said support assembly comprises a groove and wherein said sliding member comprises an edge, said edge configured to engage said groove.

25. An imaging system in accordance with Claim 24 wherein said support assembly comprises a plurality of sliding segments, each sliding segment configured to engage said edge.

26. An imaging system in accordance with Claim 24 wherein said support assembly comprises a plurality of rollers, each roller configured to engage said edge.

27. An imaging system in accordance with Claim 23 wherein said support assembly is configured to support a moment load from a weight of said detector transport member.

28. An imaging system in accordance with Claim 15 wherein said arcuate base is configured to rotate said arcuate detector transport member about said examination axis through an arc of less than about one hundred eighty degrees.

29. An imaging system in accordance with Claim 28 wherein said arcuate base is configured to rotate said arcuate detector transport member about said examination axis through an arc of about ninety degrees.

30. An imaging system in accordance with Claim 28 wherein said arcuate base is configured to rotate said arcuate detector transport member about said examination axis through an arc of less than about ninety degrees.

31. An imaging system in accordance with Claim 15 wherein said arcuate base is configured to maintain said arcuate detector transport member substantially stationary relative to said arcuate base.

32. An imaging system in accordance with Claim 31 wherein said arcuate base is configured to maintain said arcuate detector transport member

substantially stationary while said at least one detector is receiving at least one of transmission x-ray photons, transmission gamma rays, and emission gamma rays.

33. An imaging system in accordance with Claim 15 wherein said at least one detector is fixedly coupled to said detector transport member.

34. An imaging system in accordance with Claim 15 wherein said at least one detector is coupled to said detector transport member through a tilting mechanism configured to modify an orientation of said at least one detector with respect to said examination axis.

35. An imaging system in accordance with Claim 15 wherein said at least one detector comprises cadmium zinc telluride (CZT).

36. An imaging system in accordance with Claim 15 wherein said at least one detector is configured to receive emission gamma rays at each of said at least one of a plurality of imaging positions, said emission gamma rays emitted from an imaging volume proximate said examination axis.

37. An imaging system in accordance with Claim 34 wherein said at least one detector comprises two detectors, each detector oriented at about ninety degrees with respect to the other.

38. An imaging system in accordance with Claim 15 further comprising at least one of a transmission x-ray source and a transmission gamma source wherein said at least one detector is configured to receive at least one of transmission x-ray photons, transmission gamma rays, and emission gamma rays at each of said at least one of a plurality of imaging positions, said emission gamma rays emitted from an imaging volume proximate said examination axis, said transmission x-ray photons emitted from said transmission x-ray source, and said transmission gamma rays emitted from said transmission gamma ray source.

39. An imaging system in accordance with Claim 15 wherein all said detectors are positioned at different fixed locations along said detector transport member.

40. A medical imaging apparatus comprising:

a generally arcuate shaped support assembly;

a detector transport member movably coupled to said generally arcuate shaped support assembly; and

at least one detector fixedly coupled to said detector transport member.

41. A medical imaging apparatus in accordance with Claim 40 wherein said generally arcuate shaped support assembly comprises a generally c-shaped body.

42. A medical imaging apparatus in accordance with Claim 40 wherein said detector transport member is generally arcuate shaped.

43. A medical imaging apparatus in accordance with Claim 40 wherein said generally arcuate shaped support assembly is coupled to a base, said base comprising a power transmission member configured to move said detector transport member with respect to said base.

44. A medical imaging apparatus in accordance with Claim 43 wherein said power transmission member receives power from an electric motor.

45. A medical imaging apparatus in accordance with Claim 44 wherein said electric motor receives power from an electric source located in said base.